

***Claim Rejections Under 35 U.S.C. § 103***

Claims 1, 2, 5, 6, 8-10, 13, and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Takeda et al. (U.S. Patent Application Publication 2001/0031387 in view of Koichi et al. (JP 2002-012406). This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested. The following is a comparison of the present invention, as claimed, and the cited prior art.

An aspect of the invention, per claim 1, is a startup combustor that is used at startup to warm a fuel reformer characterized by a chamber for combusting fuel and a fuel port connected to the chamber for introducing fuel. An air port is connected to the chamber for introducing air and an ignition source is connected to the chamber for igniting fuel and air introduced thereto. A filter is within the chamber, which is capable of preventing a substantial portion of any soot contained in the air or fuel or which can develop from combusting the fuel with the ignition source from passing through the filter. A controller regulates the introduction of air and fuel to the chamber and is capable of maintaining an excess air ratio to regenerate the filter.

Another aspect of the invention, per claim 9, is a process for operating a startup combustor to regenerate a filter. The process comprises combining air and a hydrocarbon fuel to form an air hydrocarbon fuel mixture. The mixture is combusted to form a combustion gas that can also contain soot. The combusted gas is passed through a filter to collect any soot onto the filter. When a predetermined amount of soot has collected on the filter, the filter is regenerated by introducing an excess air ratio of about 1.5 to about 2.8 for a set period of time to oxidize the collected soot on the filter.

The Examiner asserted that Takeda et al. substantially teach the claimed invention except for the filter. The Examiner alleged that Koichi et al. disclose a honeycomb filter for the purpose

of preventing a substantial portion of soot contained in the air or fuel from passing through the filter and a controller for regenerating the filter. The Examiner concluded that it would have been obvious to modify the combustor of Takeda et al. with a filter and controller to minimize the adverse effect of soot.

Takeda et al. and Koichi et al., whether taken in alone, or in combination, do not suggest the claimed startup combustor and process for operating a startup combustor because there is no motivation to add a filter to the combustor of Takeda et al. Takeda (particularly para. [0028], [0031], and [0041] and Figs. 1 and 2) disclose that a first mixing chamber 30, combustion heater 36, second mixing chamber 38, and heat exchanger 52 are connected in series. A portion of the fuel is burned by the combustion heater 36 for vaporizing the remaining fuel and the vaporized fuel is fed to the heat exchanger 52. The combustion gas is supplied into the combustion gas passage 58 so as to exchange heat with a fluid and is subsequently discharged via a combustion exhaust gas pipe 60. The combustion gas of Takeda et al. is used only to exchange heat with the fluid and is not supplied to the reformer section 80. Koichi et al. teach that the filter removes soot from a fuel gas that is reformed to provide carbon monoxide and hydrogen for use in a fuel cell. The gases combusted in the combustor of Takeda et al. do not mix with the fuel cell fuel gases and do not pass through the reformer and/or fuel cell. Rather, the combustion gases of Takeda et al. are exhausted from the combustor. Therefore, there would not be any suggestion nor motivation to provide the Takeda et al. device with a filter taught by Koichi et al. to collect soot, which would otherwise be supplied to and degenerate a reformer.

Further, there is no reasonable expectation of success that the filter of Koichi et al. substituted in the combustion chamber of Takeda et al. would collect soot contained in the fuel fed to the reformer of Takeda et al.

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge readily available to one of ordinary skill in the art. *In re Kotzab*, 217 F.3d 1365, 1370 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). The Examiner has not shown any suggestion in either Takeda et al. or Koichi et al. to provide a filter within the combustion chamber, as required by claim 21, or pass combusted gas through a filter to collect soot, as required by claim 9. The mere fact that references can be combined or modified does not render the resulting combination obvious unless the prior art also suggests the desirability of the modification. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).

The Examiner is required to discharge the initial burden by, *inter alia*, making **clear and particular** factual findings as to a **specific understanding** or **specific technological principle** which would have **realistically** impelled one having ordinary skill in the art to modify the an applied reference to arrive at the claimed invention based upon facts, -- not generalizations. *Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 57 USPQ2d 1161 (Fed. Cir. 2000); *Ecolchem Inc. v. Southern California Edison, Co.*, 227 F.3d 1361, 56 USPQ2d 1065 (Fed. Cir. 2000); *In re Kotzab, supra*; *In re Dembiczak*, 175 F.3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999). That burden has not been discharged, as the Examiner has provided no factual basis for modifying the combustor or process of Takeda et al. to obtain the claimed startup combustor or process. The Examiner did not make the requisite "clear and particular" factual findings to support the conclusion that one having ordinary skill in the art would have been realistically led to deviate

from the combustor and process of Takeda et al. to obtain the startup combustor and process for operating a startup combustor, as required by claims 1 and 9, respectively.

The requisite motivation to support the conclusion of obviousness must stem from the applied prior art as a whole and realistically impel one having ordinary skill in the art to modify a specific reference in a specific manner to arrive at a specifically claimed invention. *In re Deuel*, 51 F.3d 1552, 34 USPQ2d 1210 (Fed. Cir. 1995); *In re Newell*, 891 F.2d 899, 13 USPQ2d 1248 (Fed. Cir. 1989). Accordingly, the Examiner is charged with the initial burden of identifying a source in the applied prior art for the requisite realistic motivation. *Smiths Industries Medical System v. Vital Signs, Inc.*, 183 F.3d 1347, 51 USPQ2d 1415 (Fed. Cir. 1999); *In re Mayne*, 104 F.3d 1339, 41 USPQ2d 1449 (Fed. Cir. 1997). The Examiner has not met the burden of identifying a source in the applied prior art for the required realistic motivation of modifying the combustor and process of Takeda et al. to obtain the startup combustor and process for operating a startup combustor, as required by claims 1 and 9, respectively.

The only disclosure of the claimed startup combustor comprising a filter within the combustion chamber, which is capable of preventing a substantial portion of any soot from passing through the filter, and the claimed process for operating a startup combustor to regenerate a filter, as required by claims 1 and 9, respectively, is found in Applicant's disclosure. Though, the Examiner asserted that the claimed startup combustor and process for operating a startup combustor would have been obvious, the teaching or suggestion to make a claimed combination and the reasonable expectation of success must both be found in the prior art, and not be based on Applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Apparently, the Examiner has relied on impermissible hindsight reasoning in reaching the conclusion of obviousness.

The dependent claims are allowable for at least the same reasons as the independent claims and further distinguish the claimed invention. For example, claim 2 further requires a means for detecting soot accumulation onto the filter. Claim 8 further requires two or more filters arranged in series downstream of the ignition source. Claim 10 further requires estimating the level of accumulated soot onto the filter. Claim 15 further requires passing the combusted gas through one or more additional filters arranged in series to collect soot. The cited prior art does not suggest the claimed startup combustor or process for operating a startup combustor with these additional limitations.

***Allowable Subject Matter***

The Examiner objected to claims 3, 4, 7, 11, 12, and 14 as being dependent upon a rejected base claim but would be allowable if rewritten in independent form.

Applicant gratefully acknowledges the indication of allowable subject matter. Applicant does not believe that it is necessary to place the objected claims in independent form, as it is believed that independent claims 1 and 9 are allowable for the reasons explained above.

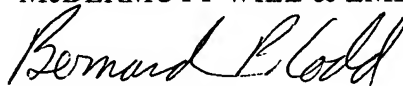
In view of the above remarks, Applicant submits that this application should be allowed and the case passed to issue. If there are any questions regarding this response or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

**Application No.: 10/733,369**

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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